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New soybean aphid information online

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A series of scientific papers on the soybean aphid were recently published on the World Wide Web [1], as free PDF documents.

You must enter your name and a password before you access the publications. At the site, click on *Annals of the Entomological Society of America*, and then the "bullet" Online Edition (1999-Current). Then click on Current issue under the *Annals* journal title. Below are the titles and edited summaries for each paper [2].

Soybean Aphid Biology in North America

Soybean aphid uses native and exotic primary hosts found in North America, specifically buckthorn (*Rhamnus cathartica* and *Rhamnus alnifolia*). The principal secondary host is soybean but there seems to be a lengthy gap in early spring between the production of alatae (winged aphids) on buckthorn and the occurrence of soybean. In the fall, when soybean is senescing, a biological bottleneck is created as the aphid must develop sexual morphs on soybean that emigrate back to the primary host to complete the sexual phase of its life cycle. During the summer, winged aphids develop during any generation on soybean, which places much of the soybean crop at risk of pest invasion even if the insect does not overwinter locally.

The Soybean Aphid in China: A Historical Review

Although there is a wealth of literature on soybean aphid, much of it is written in Chinese. Chinese-language literature is reviewed on the biology, ecology, natural enemies, and control of the soybean aphid in China.

Assessing the Invasion by Soybean Aphid (Homoptera: Aphididae): Where Will It End?

The authors examined possible pathways for the arrival of the insect, considered the likelihood for establishment in different regions of the United States, and described patterns of spread in the U.S. Historical records of aphid interceptions by the USDA (Animal and Plant Health Inspection Service) suggest that the soybean aphid most likely arrived in the U.S. from Japan or China, either carried by an international airline passenger or associated with horticultural cargo. Two methods of climate comparison suggest that the aphid may ultimately be present in all soybean producing areas of the U.S.

A Guide to Separating *Aphis glycines* and Morphologically Similar Species That Share Its Hosts.

The soybean aphid, *Aphis glycines*, shares its hosts with two other aphid species, *Aphis nasturtii* and *Aphis gossypii*. Tables of characters and photographs are provided to assist in the separation of these three species. A photographic plate showing male and several female stages is included.

Population Dynamics of *Aphis glycines* and Its Natural Enemies in Soybean in Northern China

During 2002 in northern China, aphids colonized soybean when plants were still small in early July. After a lag of 2 weeks, aphid density increased rapidly in late July, reaching a peak of 114±46 aphids per five soybean plants on August 1. The population declined to a plateau immediately after this peak and then declined again starting in mid-August, although a second small peak occurred in late August. The finite rate of increase varied from zero- to five-fold, and the aphid seemed to be limited by natural enemies such as a parasitic wasp and lady beetles.

Soybean Aphid Predators and Their Use in Integrated Pest Management

This research discusses the roles of predatory arthropods in field crops and sets forth a conceptual model to identify key predators. We identify *Orius insidiosus* (insidious flower bug) and *Harmonia axyridis* (multicolored Asian lady beetle) as potentially key predators, and show our findings on their phenology in soybean fields and their impact on soybean aphid population dynamics. There is information on how this can be used in integrated pest management programs for soybean aphid, and points to gaps in knowledge where future studies are needed.

Prospects for Importation Biological Control of the Soybean Aphid: Anticipating Potential Costs and Benefits

The potential pros and cons of using imported biological control organisms against the soybean aphid are discussed. Importation of exotic organisms for biological control is never completely risk-free, but the potential negative impacts of not achieving biological control of invasive pests may exceed the risks associated with a biological control introduction. The potential benefits of biological control include reduced insecticide use and a reduced ability of the invasive pest to impact native flora and fauna. The authors outline the possible scope of these benefits may be for the soybean aphid. They also outline the potential risks to nontarget organisms that would be associated with imported biological control organisms of the soybean aphid.

An adult lady beetle hunts soybean aphids.

Enlarge [3]

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